

ABSTRACT OF THE DISCLOSURE

Disclosed is a method for fabricating capacitors for semiconductor devices. This method includes the steps of forming a lower electrode on an understructure of a semiconductor substrate, depositing an amorphous TaON thin film over the lower electrode, annealing the deposited amorphous TaON thin film in an NH_3 atmosphere, and repeating the deposition of the amorphous TaON thin film and the annealing of the deposited amorphous TaON thin film at least one time, thereby forming a TaON dielectric film having a multi-layer structure, and forming an upper electrode over the TaON dielectric film. The TaON dielectric film having a multi-layer structure exhibits a dielectric constant that is superior to those of conventional dielectric films. Accordingly, the TaON dielectric film of the invention can be used for capacitors in next generation semiconductor memory devices of 256 M grade and higher.

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